

1-29. (CANCELLED)

30. (NEW) An apparatus for injecting an active product comprising a reserve (2) of working liquid pressurized by a pressurized liquid generator (3), a handpiece (5) terminating in an active extremity (8) that comprises an outlet means for a pressurized jet of working liquid and a jet of active product wherein,

a principal fluid circuit branch (4) connecting a reserve (2) of working liquid to the handpiece (5), with flow of liquid through the principal fluid circuit branch being controlled by one of an opening or closing of a first isolation valve (22);

a secondary derivation branch (15) parallel to the principal fluid circuit branch (4) and fluidly isolated from the principal fluid circuit branch (4), designed to contain active product, with flow through the principal fluid circuit branch (4) being controlled by one of an opening or closing of a second isolation valve (23); and

a multiplexing means (24) for independent control of the one of the opening and closing of the first and second isolation valves (22, 23) according to predetermined parameters.

31. (NEW) The apparatus according to claim 30 wherein the apparatus further comprises a multiplexing means (24) for independent control over the opening and closing of the isolation valves (22, 23) according to any predetermined parameters previously selected and stored by a surgeon as a function of the particular case to be treated.

32. (NEW) The apparatus according to claim 30 wherein the reserve (2) of working liquid is a flexible plastic pouch containing the working liquid and the generator (3) of pressurized liquid is an enclosure surrounding the reserve (2) of working liquid which is filled with neutral gas until the reserve (2) is pressurized sufficiently to compress the pouch and pressurize the liquid.

33. (NEW) The apparatus according to claim 30 wherein the active extremity (8) is a catheter (9).

34. (NEW) The apparatus according to claim 33 wherein the catheter (9) comprises at a distal extremity a retractable perforating or puncturing tool movable between an extended working position and a retracted safety position inside the catheter.

35. (NEW) The apparatus according to claim 34 wherein the catheter (9) has at the distal extremity a retractable perforating or puncturing tool that is movable and has a retractable needle.

36. (NEW) The apparatus according to claim 30 wherein the apparatus further comprises a suction system (13) connected to a vacuum source (14).

37. (NEW) The apparatus according to claim 30 wherein an anti-return flow control device (21) is located at an outlet of the principal branch (4).

38. (NEW) The apparatus according to claim 30 wherein the secondary derivation branch (15) is isolated from the principal branch (4) by means of two anti-return flow control devices (19, 20) attached to two extremities of a derivation tube.

39. (NEW) The apparatus according to claim 30 wherein the first and second isolation valves (22, 23) are attached at an immediate proximity, respectively, of anti-return flow control devices (21) and (20).

40. (NEW) The apparatus according to claim 39 wherein the anti-return flow control devices (20) and (21) are integrated within the second and first isolation valves (23) and (22), respectively.

41. (NEW) The apparatus according to claim 30 wherein the secondary derivation branch (15) is connected to a reserve of active product (16) by a communicating device (17).

42. (NEW) The apparatus according to claim 41 wherein the communicating device (17) is a charge valve (18) with two or three tracks.

43. (NEW) The apparatus according to claim 30 wherein the derivation branch (15) comprises a tubular portion (30) serving as a reserve that is calibrated for one precise dose of active product.

44. (NEW) The apparatus according to claim 30 wherein the secondary derivation branch (15) comprises a tubular portion or restriction (33) having a reduced interior diameter, used to break the pressure of the liquid passing through it.

45. (NEW) The apparatus according to claim 44 wherein the tubular portion or restriction (33) of reduced interior diameter is located at an inlet to the secondary derivation branch (15) before the anti-return flow control device (19).

46. (NEW) The apparatus according to claim 30 wherein at least one of the first and second valves (22, 23) on the two circuit branches comprises a cam-shaped roller which, when closed, crushes the tube from the outside.

47. (NEW) The apparatus according to claim 30 wherein the elements on the fluid circuit that could become contaminated are sterile, disposable, single-use elements.

48. (NEW) The injection method using the injection apparatus according to claim 30 wherein a hollow injection channel is formed by blasting a jet of pressurized working liquid, and then in the next step the active product is injected through the injection channel.

49. (NEW) A method of generating a sequence of liquid jets using an apparatus comprising a reserve (2) of working liquid pressurized by a pressurized liquid generator (3), a handpiece (5) terminating in an active extremity (8) comprising outlet means for a jet of pressurized working liquid and a jet of active product, a principal fluid circuit branch (4) connecting the reserve of working liquid (2) to the handpiece (5), with the flow of liquid through the branch being controlled by opening or closing an first isolation valve (22), a secondary derivation branch (15) parallel to the principal branch (4) and fluidly isolated from the principal branch , designed to contain an active product, with the flow of liquid through the secondary derivation branch (15) being controlled by opening or closing second an isolation valve (23), and a multiplexing means (24) for independent control over the opening and closing of the isolation valves (22, 23) according to predetermined parameters, characterized by generating a sequence consisting of at least one impulse of pressurized working liquid followed by a microscopically dosed impulse of active product.

50. (NEW) The method of generating a sequence of liquid jets according to claim 49 wherein the first isolation valve (22) on the principal branch (4) on the circuit is opened to generate an impulse formed of an appropriate quantity of pressurized working liquid, and then in a later phase the second isolation valve (23) on the derivation branch (15) is opened to generate an impulse formed of the desired quantity of active product.

51. (NEW) The method of generating a sequence of liquid jets according to claim 49 wherein the impulse of active product is generated at a pressure which essentially corresponds to that of the impulse of working liquid.

52. (NEW) The method of generating a sequence of liquid jets according to claim 49 wherein the impulse of active product is generated at less pressure than that of the working liquid and preferably at low pressure.

53. (NEW) The method of generating a sequence of liquid jets according to claim 49 wherein the impulse of active product is followed by another impulse of pressurized working liquid.

54. (NEW) The method of generating a sequence of liquid jets according to claim 49 wherein the quantities of liquid forming the impulses of working liquid and active product are precisely established by fixing the opening time of each of the first and second isolation valves (22, 23).

55. (NEW) The method of generating a sequence of liquid jets according to claim 54 wherein the opening time of the first and second isolation valves (22, 23) varies as a function of viscosity of the liquids.

56. (NEW) A method of generating a sequence of liquid jets using an apparatus comprising a reserve (2) of working liquid pressurized by a pressurized liquid generator (3), a handpiece (5) terminating in an active extremity (8) comprising outlet means for a pressurized jet of working liquid and a jet of active product, a principal fluid circuit branch (4) connecting the reserve of working liquid (2) to the handpiece (5), with the flow of liquid through the principal fluid circuit branch (4) being controlled by the opening or closing of a first isolation valve (22),

a secondary derivation branch (15) parallel to the principal fluid circuit branch (4) and fluidly isolated from the principal fluid circuit branch (4), designed to contain active product, with the flow of liquid through the secondary derivation branch (15) being controlled by the opening or closing of a second isolation valve (23), and a multiplexing means (24) to independently control the opening and closing of the first and second isolation valves (22, 23) according to predetermined parameters, wherein the first and second isolation valves (22, 23) of the two branches (4, 15) of the circuit are opened simultaneously in order to generate a jet consisting of a mixture of active product and working liquid in proportions that are precisely fixed by regulating the opening time of each of the first and second isolation valves (22, 23).

57. (NEW) The method of generating a sequence of liquid jets according to claim 49 wherein a very small quantity of active product is used and the active product is used in microscopic doses.

58. (NEW) The method of generating a sequence of liquid jets according to claim 49 further comprising the steps of:

purging air from the apparatus in order to fill it with working liquid;

charging the apparatus with active product;

preparing one or more blasts by successively disposing packets of fluid in the appropriate order and quantity and placing them in blasting position at the active distal extremity of the apparatus just before the outlet orifice;

placing the active distal extremity of the apparatus in blasting position; and

performing at least one blast of a series of liquid jets.